

CLAIMS

We claim:

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1 1. A method for processing at least one die which comprises an integrated
2 circuit, said method comprising:
3 applying an identification code to a carrier;
4 depositing a singulated die into said carrier, said singulated die
5 comprising an integrated circuit, said carrier holding said
6 singulated die.

1 2. A method as in claim 1 wherein said singulated die is deposited into
2 said carrier without any packaging of said singulated die.

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1 3. A method as in claim 1 wherein said identification code comprises
2 information identifying at least one semiconductor wafer in a specific lot of
3 wafers.

1 4. A method as in claim 3 wherein said identification code comprises at
2 least one of a bar code or a code stored in a memory device on said carrier.

1 5. A method as in claim 4 wherein said memory device comprises one of
2 a magnetic media or a semiconductor memory device.

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1 6. A method as in claim 1 further comprising:
2 applying a die identification code to said singulated die, said die
3 identification code comprising information relating to said die.

1 7. A method as in claim 6 wherein said die identification code comprises
2 information identifying the wafer from which said singulated die was created.

1 8. A method as in claim 7 wherein said die identification code is applied
2 to said singulated die after said singulated die is deposited into and secured in
3 said carrier.

1 9. A method as in claim 7 wherein said die identification code further
2 comprises information identifying a particular wafer processing lot in which
3 the wafer was created.

1 10. A method as in claim 8 wherein said die identification code is applied
2 to said singulated die through an opening in said carrier.

1 11. A method as in claim 1 wherein said carrier secures said singulated die
2 during a burn-in testing of said singulated die.

1 12. A method as in claim 11 wherein said carrier secures said singulated
2 die during use of said singulated die after said burn-in testing and said carrier
3 acts as a final package for said singulated die.

1 13. A method as in claim 12 wherein said carrier secures a plurality of
2 singulated dies comprising said singulated die.

1 14. A method as in claim 1 further comprising:

2 mounting a plurality of elongate, resilient electrical contact elements
3 on contact pads of said singulated die.

1 15. A method as in claim 14 wherein said plurality of elongate resilient
2 electrical contact elements are mounted prior to depositing said singulated die
3 into said carrier.

1 16. A method as in claim 15 further comprising:
2 applying a top on said carrier after depositing said singulated die into
3 said carrier.

1 17. A method as in claim 15 further comprising:
2 mounting said carrier onto a substrate having a plurality of electrical
3 contact pads.

1 18. A method as in claim 17 wherein said carrier is mounted on said
2 substrate prior to depositing said singulated die onto said carrier.

1 19. A method as in claim 18 wherein said carrier is mounted on said
2 substrate after depositing said singulated die onto said carrier.

1 20. A method as in claim 17 wherein each of said contact pads on said
2 singulated die are electrically coupled to a corresponding one of said plurality
3 of electrical contact pads on said substrate through a corresponding one of said
4 elongate, resilient electrical contact elements.

1 21. A method as in claim 20 wherein each of said elongate, resilient
2 electrical contact elements is freestanding.

1 22. A method as in claim 14 wherein each of said elongate, resilient
2 electrical contact elements is freestanding.

1 23. A method as in claim 17 wherein said substrate is a test printed circuit
2 board which is used to test said singulated die.

1 24. A method as in claim 17 wherein said substrate is a final package unit
2 for said singulated die.

1 25. A method as in claim 17 wherein said substrate is used to test said
2 singulated die, and if said singulated die passes testing, said substrate is used
3 to package said singulated die for use.

1 26. A method as in claim 25 wherein if said singulated die fails testing, said
2 singulated die is removed from said carrier and another singulated die is
3 deposited into said carrier.

1 27. A method as in claim 2 wherein said identification code comprises
2 information identifying at least one semiconductor wafer in a specific
3 processing lot of wafers and wherein said method further comprises:
4 exposing said singulated die, while secured in said carrier, to a burn-in
5 testing environment;
6 characterizing said singulated die based on said exposing;

7 reading said identification code.

1 28. A method as in claim 27 wherein said reading occurs after said
2 characterizing and wherein said reading identifies said specific processing lot.

1 29. A method as in claim 27 further comprising:
2 mounting, prior to said exposing, a plurality of elongate, resilient
3 electrical contact elements on contact pads of said singulated die;
4 mounting, prior to said exposing, said carrier onto a substrate having a
5 plurality of electrical contact pads, wherein each of said contact
6 pads on said singulated die are electrically coupled to a
7 corresponding one of said plurality of electrical contact pads on
8 said substrate through a corresponding one of said elongate,
9 resilient electrical contact elements.

1 30. A method as in claim 29 wherein each of said elongate, resilient
2 electrical contact elements is freestanding.

1 31. A method as in claim 29 wherein each of said elongate, resilient
2 electrical contact elements is compressed less during said exposing than
3 during final use of said singulated die.

1 32. A method as in claim 20 wherein each of said elongate, resilient
2 electrical contact elements is compressed less during said exposing than
3 during final use of said singulated die.

1 33. A method as in claim 20 further comprising removing said singulated
2 die from said carrier after testing said singulated die and packaging said
3 singulated die for use.

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2 34. A method for processing at least one die which comprises an integrated
3 circuit, said method comprising:
4 applying an identification code to a die;
5 depositing said die into said carrier, said die comprising an integrated
circuit, said carrier holding said die in a singulated form.

1 35. A method as in claim 34 wherein said die is deposited into said carrier
2 without any packaging of said die.

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1 36. A method as in claim 34 wherein said identification code comprises
2 information identifying at least one semiconductor wafer in a specific lot of
3 wafers.

1 37. A method as in claim 36 wherein said identification code comprises at
2 least one of a bar code or a code stored in a memory device on said carrier.

1 38. A method as in claim 37 wherein said memory device comprises a
2 magnetic media.

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1 39. A method as in claim 36 wherein said identification code comprises
2 information identifying the wafer from which said die was created.

1 40. A method as in claim 39 wherein said identification code is applied to
2 said die after said die is deposited into and secured in said carrier.

1 41. A method as in claim 39 wherein said identification code further
2 comprises information identifying a particular wafer processing lot in which
3 the wafer was created and said identification code is applied before said die is
4 singulated.

1 42. A method as in claim 40 wherein said identification code is applied to
2 said die through an opening in said carrier.

1 43. A method as in claim 34 wherein said carrier secures said die during a
2 burn-in testing of said die.

1 44. A method as in claim 43 wherein said carrier secures said die during
2 use of said die after said burn-in testing and said carrier acts as a final package
3 for said die.

1 45. A method as in claim 44 wherein said carrier secures a plurality of
2 singulated dies comprising said die.

1 46. A method as in claim 34 further comprising:
mounting a plurality of elongate, resilient electrical contact elements
on contact pads of said die.

1 47. A method as in claim 46 wherein said plurality of elongate, resilient
2 electrical contact elements are mounted prior to depositing said die into said
3 carrier.

1 48. A method as in claim 47 further comprising:
2 applying a top on said carrier after depositing said die into said carrier.

1 49. A method as in claim 47 further comprising:
2 mounting said carrier onto a substrate having a plurality of electrical
3 contact pads.

1 50. A method as in claim 49 wherein said carrier is mounted on said
2 substrate prior to depositing said die onto said carrier.

1 51. A method as in claim 50 wherein said carrier is mounted on said
2 substrate after depositing said die onto said carrier.

1 52. A method as in claim 49 wherein each of said contact pads on said die
2 are electrically coupled to a corresponding one of said plurality of electrical
3 contact pads on said substrate through a corresponding one of said elongate,
4 resilient electrical contact elements.

1 53. A method as in claim 52 wherein each of said elongate, resilient
2 electrical contact elements is freestanding.

1 54. A method as in claim 46 wherein each of said elongate, resilient
2 electrical contact elements is freestanding.

1 55. A method as in claim 49 wherein said substrate is a test printed circuit
2 board which is used to test said die.

1 56. A method as in claim 49 wherein said substrate is a final package unit
2 for said die.

1 57. A method as in claim 49 wherein said substrate is used to test said die,
2 and if said die passes testing, said substrate is used to package said die for use.

1 58. A method as in claim 57 wherein if said die fails testing, said die is
2 removed from said carrier and another singulated die is deposited into said
3 carrier.

1 59. A method as in claim 35 wherein said identification code comprises
2 information identifying at least one semiconductor wafer in a specific
3 processing lot of wafers and wherein said method further comprises:
4 exposing said die, while secured in said carrier, to a burn-in testing
5 environment;
6 characterizing said die based on said exposing;
7 reading said identification code.

1 60. A method as in claim 59 wherein said reading occurs after said
2 characterizing and wherein said reading identifies said specific processing lot.

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1 61. A method as in claim 59 further comprising:
2 mounting, prior to said exposing, a plurality of elongate, resilient
3 electrical contact elements on contact pads of said die;
4 mounting, prior to said exposing, said carrier onto a substrate having a
5 plurality of electrical contact pads, wherein each of said contact
6 pads on said die are electrically coupled to a corresponding one
7 of said plurality of electrical contact pads on said substrate
8 through a corresponding one of said elongate, resilient electrical
9 contact elements.

1 62. A method as in claim 61 wherein each of said elongate, resilient
2 electrical contact elements is freestanding.

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1 63. A method as in claim 61 wherein each of said elongate, resilient
2 electrical contact elements is compressed less during said exposing than
3 during final use of said die.

1 64. A method as in claim 52 wherein each of said elongate, resilient
2 electrical contact elements is compressed less during said exposing than
3 during final use of said die.

1 65. A method as in claim 52 further comprising removing said die from
2 said carrier after testing said die and packaging said die for use.